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ABSTRACT

Laptop computers offer a unique way to package a course so that students will learn academic communication skills using the latest technological tools. Laptops can be programmed to be compatible with a school's computer system, eliminating many potential problems students might face in adapting their home computers. Additionally, a level playing field is created because all students use the same tools and all students enjoy increased access to instructors through electronic mail. To best exploit these benefits, Mesa Community College, in Arizona, created an experimental English course stored on the hard drives of laptop computers, including the course syllabus, assignments, lectures, and exercises. The laptops also featured directions for such tasks as running the software, connecting to the Internet, and faxing assignments. Assignments are to be written using Microsoft Word, and they will include "hyper links" within the document that link lectures and exercises to the lesson. Assignments, lectures, and instructions are all kept in different directories, and instructors can write additional course elements linked to the curriculum by hyper links. Because the course work is available in software format, it is easy to change courses on the laptop without disturbing the general configuration of the software. (MAB)

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DESIGNING A VIRTUAL CLASSROOM THROUGH THE USE OF LAPTOP COMPUTERS

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Biographical Sketch

Allen Bradshaw:

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- English Technology Coordinator
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Joan Massey:

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- Computer English Instructor
- Coordinator Computer English 101 curriculum
- Curriculum writer for Internet Project

Designing a Virtual Classroom through the Use of Laptop Computers

Philosophy:

Laptop computers offer a unique way to package a course so that students will learn academic communication skills using the latest technological tools. Laptops are an important part of the new communications age, the age of instant access to information. Laptops are portable, allowing the "classroom" to accommodate busy schedules, shut-ins, homemakers, rotating shifts, etc. These same laptops are powerful and versatile enough to offer the same advantages that students have in a computer lab, access to a powerful word processor, Power Point lectures, connections to the EF and Internet, and daily access to an instructor (by modem and E-Mail). It can be argued that students have this same advantage with their own computers at home, but this is not so. Mesa Community College cannot, at this time, offer a student Microsoft Word 6.0, or any other software program that can be loaded onto a laptop, because of licensing difficulties. And many students can not schedule in to their day time to use the MCC's computer lab.

So a home program must depend on the equipment that is already in that home, giving some students with the latest equipment an advantage over others. Incompatibility problems with our computer bulletin board system, modems, etc. make it even more difficult for the student to succeed. Laptops can be programmed to be compatible from the start, and all students will have the same tools to succeed, **creating a level playing field**, and students can begin work without having to face the frustrations of incompatibilities or unequal equipment. Instructors can concentrate on content instead of spending much of their time helping students with the technology and software. **The laptop offers equal academic opportunities for all students, while keeping a flexible learning schedule to meet the modern students' needs.**

Laptops offer a method of packaging a course without the four walls of a classroom, the overhead projector, cooling and heating, etc, and the computer lab, with its administrative and technical overhead, networking equipment, custodial, building costs, etc. **The laptop becomes the classroom, and the learning shifts from teacher centered to the student learner.** Writing curriculum for this type of delivery will become increasingly important as technology advances. Laptop delivery may be just a rung in the ladder of changing education. When fiber optics and other connections to homes become commonplace, many educational systems will be jumping to offer courses in home, with the instructor on-line. Courses written for laptop delivery should be able to fill this need immediately. In other words, checking out laptops is the current delivery tool offering access and accessibility. As laptops become more prevalent in homes, it may be possible to download courses to student's own laptops. Later, new systems will dictate other delivery methods. **What becomes increasingly important about this project is the re-writing of curriculum to meet a changing world, and a changing educational system, and, if we write this curriculum well, we will be positioned for the new communication age.**

Curriculum Writing:

For this project, we will write an experimental English 102 laptop computer course that will be complete on the hard drive of the computer, including syllabus information, all assignments, all lectures and exercises. Also on the laptop will be all directions for running the software, connecting to the Internet, faxing assignments, etc. Students will have contact with the instructor by E-Mail or telephone for consultation. The instructor will also have office hours where students could come in for tutoring and help. The more course information contained on the computer and the less the student has to buy will help with the student costs for the laptop.

The course will be laid out with icons in the Program Manager of Windows. One group icon will hold the syllabus, one icon the assignments, another the lectures and exercises, and another the directions and technical information. The program manager window will have the Microsoft Word icon, the PowerPoint viewer icon, Netscape icon, the Fax icon, and all utility icons that the student will need.

When a student opens the assignment group icon, each assignment will be represented by a document icon. When opened, the assignment will come to screen in MS Word. Assignment documents will have "hotlinks" within the document, linking the lectures and exercises to the lesson (similar to using Netscape on the Internet).

The Generic Laptop:

Part of this project is to design a laptop computer that could be handed to a student to use as an educational tool, and to test this design for practicability. This educational tool is designed as follows:

Hardware requirements:

- 486 DX4 75 or 100 MHz laptop. 8 megs RAM minimum, 16 optimum
- 540 meg HD
- 3 1/2 disk drive
- 1 meg graphics accelerator card
- 16 bit sound card, preferably built in.
- Dual scan screen minimum, active matrix optimum
- 144000 baud fax/modem

Software requirements:

- Windows 95 as the operating system
- Microsoft office
- Netscape for Windows 95

Windows 95 gives the laptop the ability to communicate with the Internet, with E-Mail, and the EF bulletin board, and with the MCC Library. It provided the student with a method of faxing or sending documents to instructors. Windows 95 also is user friendly, and provides a user-friendly management of the laptop without other software, either docked or stand alone.

Microsoft Office gives the student word processing, a data base and spreadsheet, and an easy transfer of material over modem.

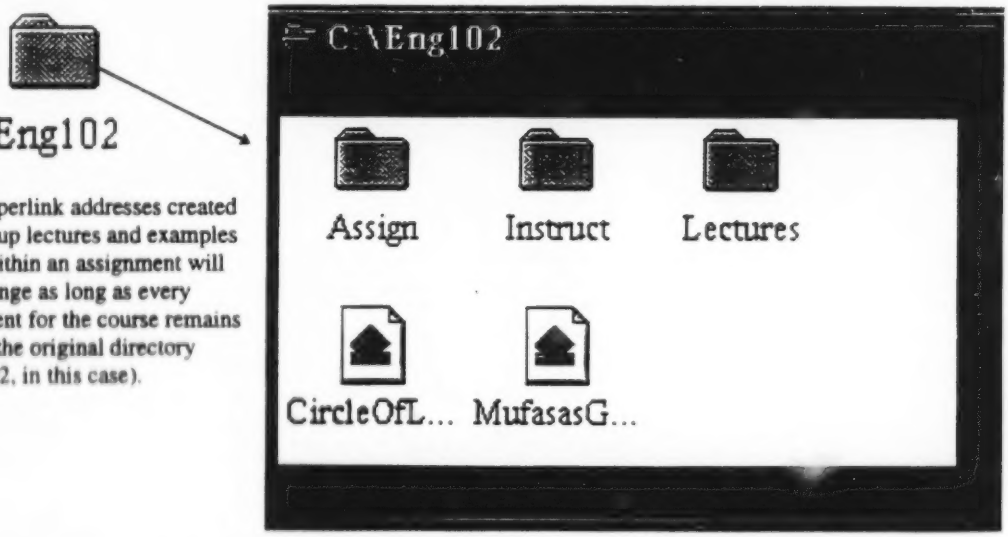
Netscape offers Internet access.

With this configuration, a student has a powerful, easy to use tool that will help in any course.

This configuration is the base running system for the English project that loads the entire course on the laptop, but could also be used for other applications, or just as a tool to supplement student learning.

The English Laptop Project:

With the configuration explained in the last section, one directory is added to the hard drive of the laptop, an English 102 directory. Inside reside three other directories, an Assignments directory, a Lectures directory, and an Instructions directory. This is the kernel for a course, and could be any course that uses this configuration. An instructor can write the lectures, assignments, etc., and place them within the course directory, linking them together with hyper links. This directory can later be downloaded to the student laptops with the general configuration. This will make it extremely simple to change the course within the laptop, without disturbing the general makeup of the software.



The hyperlink addresses created to pull up lectures and examples from within an assignment will not change as long as every document for the course remains within the original directory (Eng102, in this case).

The general instructions for using the laptop, sending documents, using Microsoft Word and Windows 95 will already be written and on the computer. The students would probably never see these directories, for all within them would be accessed from shortcut icons put in an Assignments folder on the Start button of Windows 95, or accessed from hyper links from within assignments.

Following is an example of this, taken from the general instructions that I have written for the English laptop project:

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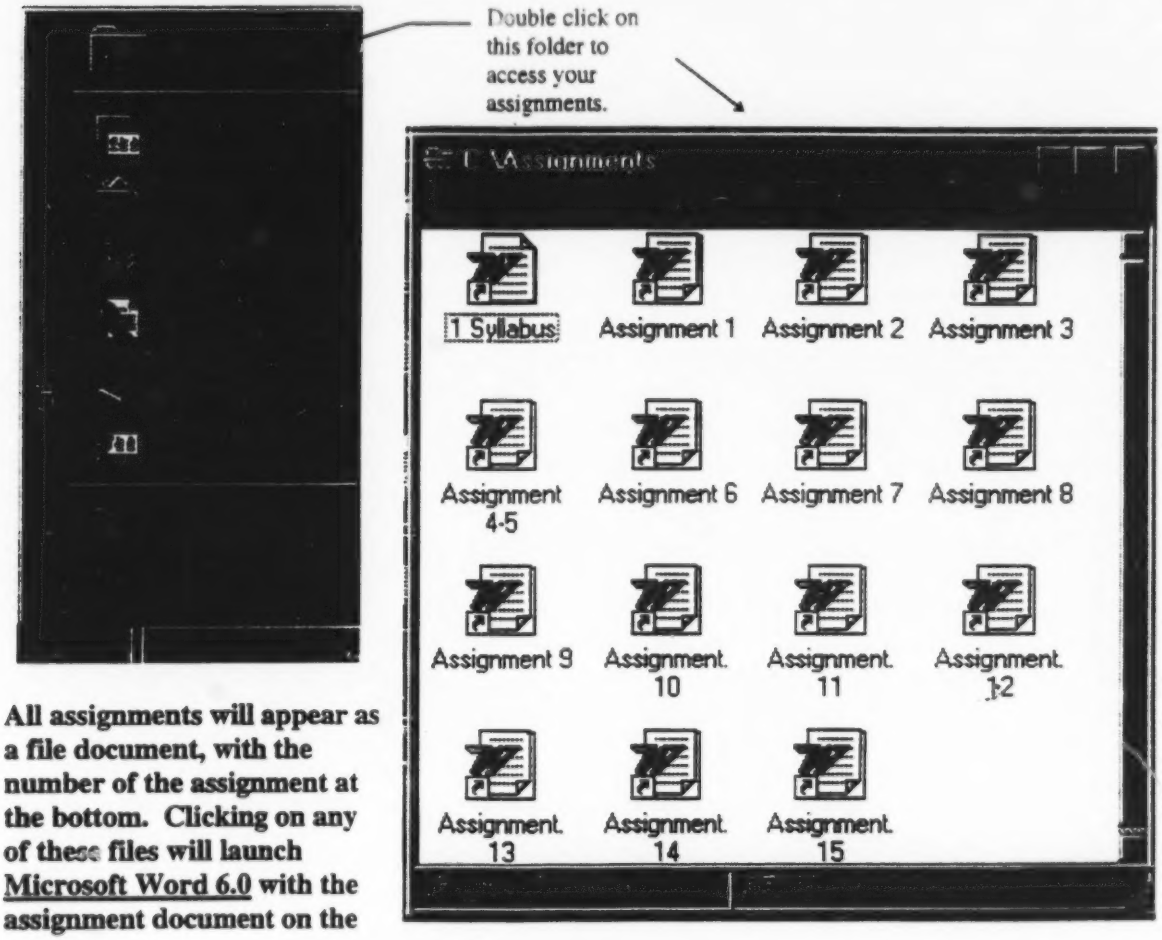
To start any assignment, click on the start button [redacted] of Windows 95 in the bottom left part of computer screen. The computer's menu will open.



All assignments will appear as a file document, with the number of the assignment at the bottom. Clicking on any of these files will launch Microsoft Word 6.0 with the assignment document on the screen.

[redacted] Following are excerpts from some of the reports generated as the project was developed

New ideas:

One of the exciting parts of this project for me has been the whole new range of ideas that working with the laptop has provided. Having the laptop for these last four weeks has opened up new concepts of instruction for me. I am already questioning why we are putting desktop computers into faculty offices, computers that can not be moved or used elsewhere. It makes more sense to me to be ordering laptops for faculty, with docking stations in the office for network connections, re-charging, and larger keyboard and screen for grading and writing. This laptop then provides the faculty member with a home computer, with access to the college (modem), and more importantly, with an instructional tool to take into the classroom, hook to a projector, and teach from.

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It is obvious to me after using this laptop that if laptops are put in the hands of faculty, soon they will be coming up with all kinds of instructional uses.

What about the student who has sophisticated equipment at home, wants to take the course in the laptop format, but does not want to pay the fee or need the laptop? I began to think about CD-ROM. I remembered all the CD-ROMs my son has been bringing home to preview (he works for Software, Etc.), Discovery Channel CD-ROMs like Wings over Europe that has narration, news clips, actual battle footage, maps, and the history of the W.W.II air battle in Europe. This program is packed on a CD, with a setup program that downloads the necessary software, etc. to run the program. We can do the same with this type of curriculum. We can package a course on CD, use a setup program to configure the home computer to run the necessary items, and send the student home with somewhat the same program as is on the laptop (there would be some limitations).

Leasing vs. Checkout:

In the last meeting, the Dean of Instructin suggested the possibility of lease/purchase instead, or as an option, to checking out the laptop. There is little doubt that college students will need a computer throughout their college career and beyond, and teaching them to use and showing them the benefits of a sophisticated computer, and then taking it back away from them, is not the most educationally sound way. It seems to me that lease/purchase has merit, particularly if **we can offer a student more than just a few curriculums to use on the computer**. I am talking about **the basic ingredients of an entire Associate's Degree program by laptop**, or whatever delivery system currently being used for this type of packaged curriculum. In English, this would be English 101, 102, a literacy requirement like Eng 217, a humanities requirement, and a literature requirement. This could be repeated in the other discipline areas, so that the laptop will become the classroom for the busy student who can not come on campus. This idea may tie in with the ILO project, but it would mean some shifting of writing and designing of curriculum to fit this mode of delivery.

Laptops in the Classroom:

Part of this assignment (it seems to me) is to look to see what possibilities laptops can add to education. One of the great benefits of a laptop is its power to present and display, and its portability. Along these lines, I took my laptop into one of my traditional (for lack of a better label) English 101 classes. I asked Audio Visual to bring an Infocus LitePro projector to the room. I hooked the laptop to the Infocus projector, used a PowerPoint program to demonstrate styles and structure of paragraphs. With the possibility that I am bragging a little, it was the most impressive way that I have ever presented this material to a class before, and never have I had better response and discussion from the class. The laptop replaced the overhead and the transparencies that I used to use, the chalkboard and squeaky chalk (not to mention the chalk dust in my sinuses and on my pants), the handouts, etc. The students later said that the paragraphs demonstrated on screen, with the ability for me to have the structure pop out at them with different colored text, make it easier for them to see and understand what I wanted. I was so enthused with the students' responses, that I have asked AV to bring back the projector on Tuesday to use again.